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Michael Stephen Saxon

Education

University of California, Santa Barbara — Santa Barbara, CA
Ph.D., Computer Engineering — *Sep 2020 - Present*
Advisor: William Yang Wang, Ph.D.

Arizona State University — Tempe, AZ
M.S., Computer Engineering: **3.91/4.0** — *Aug 2018 - May 2020*
Thesis Title—Characterizing Dysarthric Speech with Transfer Learning
Advisors: Visar Berisha, Ph.D. & Sethuraman Panchanathan, Ph.D.

Arizona State University — Tempe, AZ
B.S.E., Electrical Engineering; *Minor*, Mathematics: **3.60/4.0** — *Aug 2014 - Aug 2018*
Thesis Title—Using Goodness of Pronunciation Features for Spoken Nasality Prediction
Advisor: Visar Berisha, Ph.D.

Research Interests

Deep learning; model analysis; dataset analysis; natural language processing; spoken language understanding; representation learning; semi-supervised learning; dysarthric speech

Articles

J1. **M. Saxon**, A. Tripathi, Y. Jiao, J. Liss, V. Berisha, "Robust Estimation of Hypernasality in Dysarthria," IEEE Trans. on Audio, Speech, and Language Processing, Vol. 28, pp 2511-2522, 2020.

C5. S. Choudhary*, J. Mckenna*, **M. Saxon***, G. Strimel, A. Mouchtaris, "Semantic Complexity in End-to-End Spoken Language Understanding," Interspeech 2020, Shanghai, CN, 2020, *Accepted*.

C4. M. Moore, P. Papreja, **M. Saxon**, V. Berisha, S. Panchanathan, "UncommonVoice: A Crowdsourced Dataset of Dysphonic Speech," Interspeech 2020, Shanghai, CN, 2020, *Accepted*.

W3. **M. Saxon**, J. Liss, V. Berisha, "A new model for objective estimation of hypernasality from dysarthric speech," Workshop on Signal Analytics for Motor Speech (SAMS), Motor Speech Conference 2020, Santa Barbara, CA, February 2020.

C3. M. Moore, **M. Saxon**, H. Venkateswara, V. Berisha, S. Panchanathan, "Say what? A dataset for exploring the error patterns that two ASR engines make," Interspeech 2019, Graz, AT, 2019, pp. 2528-2532.

C2. **M. Saxon**, J. Liss, V. Berisha, "Objective Measures of Plosive Nasalization in Hypernasal Speech," 2019 IEEE International Conference on Acoustics, Speech, and Signal Processing, Brighton, UK, 2019, pp. 6520-6524.

W2. **M. Saxon***, S. Bhandari*, L. Ruskin, G. Honda, "Word Pair Convolutional Model for Happy Moment Classification," 2nd Workshop on Affective Content Analysis, AAAI 2019, Honolulu, HI, 2019, pp. 111-119. **(Workshop Oral; Runner up model in CL-Aff Shared task, 2nd place out of 47 submitted runs)**

W1. B. Gupta, **M. Saxon**, T. McDaniel, S. Panchanathan, "Chat-Box: Proposing a Mood Analyzer for Individuals with Social Interaction Disabilities," International Conference on Human-Computer Interaction, Las Vegas, NV, 2018, pp. 394-401.

C1. T. Houghton, **M. Saxon**, Z. Song, H. Nyugen, H. Jiang and H. Yu, "2D Grating Pitch Mapping of a through Silicon Via (TSV) and Solder Ball Interconnect Region Using Laser Diffraction" IEEE 66th Electronic Components and Technology Conference (ECTC), Las Vegas, NV, 2016, pp. 2222-2227. **(Texas Instruments Best Student Interactive Paper Award)**

Employment Summary

Applied Science Intern, (Alexa Edge ML/Hybrid Science) **Amazon**
Pittsburgh, PA *Jan 2020 - Aug 2020*
Rejoined same team for a double project internship building on the previous summer. Investigated the link between semantic complexity of datasets (entropy and graphical measures) and the performance of SOTA E2E SLU models on them, producing [C5]. Developed a novel model stacking specialized transformer ASR and pretrained BERT model with differentiable interface for E2E SLU optimization, to be submitted to ICASSP 2021. Return offer received.

Applied Science Intern, (Alexa Edge ML/Hybrid Science) **Amazon**
Pittsburgh, PA *May 2019 - Aug 2019*
Integrating neural end-to-end spoken language understanding for intent classification for Alexa. Experimented with developing novel semi-supervised label projection methods to generate sequential labels from full-sequence class labels. Developed architectures for "semantic endpointing," stopping the forward pass once enough information has been heard.

Research Engineer Intern **Aural Analytics**
Scottsdale, AZ *Dec 2018 - Apr 2019*
Integrated cloud-based ASR and developed in-house ASR models for integration in a clinical speech assessment product. Explored the design of deployable ASR systems robust to quality reduction under dysarthria.

Graduate Research Assistant **Arizona State University**
Tempe, AZ *Aug 2018 - Dec 2019*
Joint funding from PIs Berisha and Panchanathan see [J1, C2–C4].

REU Participant **NSF EV-STS @ Arizona State University**
Tempe, AZ *Oct 2017 - May 2018*
NSF Center for Efficient Vehicles and Sustainable Transportation Systems: Created data acquisition code for synchronous collection of LiDAR and camera image data in C++ with a corresponding video reconstruction code for part of my Senior Design project. Assisting in the development of neural network architectures for processing LiDAR data, evaluation methologies, and principled pre-processing for LiDAR input to neural networks.

Embedded Software Engineering Intern **General Dynamics Mission Systems**
Scottsdale, AZ *May 2017 - Jul 2017*
Software-level testing for an FQT release of the HOOK3 Combat Survival Radio; Preparing reports on problems detected during testing and closing PRs; Agile development team

Undergraduate Researcher **The Luminosity Lab @ Arizona State University**
Tempe, AZ *Aug 2016 - May 2018*
Developing software for networked embedded systems; Writing pathfinding algorithms for autonomous drones in Python; Utilizing machine learning to build data analysis models

Miscellaneous

Awards—National Science Foundation (NSF) Graduate Research Fellowship Program (2020)

Software Proficiencies—Python (Pytorch, HuggingFace, Numpy, SciPy, AllenNLP), BASH, Apache Spark, C/C++, OpenCV, Kaldi, MATLAB, Linux, Verilog

Professional Societies—IEEE (Student Member), AAAI (Student Member)

Service—Reviewer, IEEE GlobalSIP 2019, IEEE ICASSP 2020